

Answer on Question #60708 – Math – Complex Analysis

Question

What is the value of $(-i)^{8n+1} + (-i)^{8n+3}$ where n is a natural number?

Solution

$$\begin{aligned} & -\sqrt{(-1)^{8n+1}} + \sqrt{(-1)^{8n+3}} = -i^{8n+1} + i^{8n+3} = i^{8n}(i^3 - i) = \\ & = (i^2 i^2)^{2n}(i \cdot i^2 - i) = (-1 \cdot (-1))^{2n}(i \cdot (-1) - i) = 1(-i - i) = -2i, \end{aligned}$$

where $i^2 = -1$.

Answer: $-2i$.